Can We Sell EcoSan Compost in Haiti?: A Market Analysis Report

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Contents

Executive Summary

With the support of Oxfam Great Britain, SOIL conducted a market assessment of compost and fertilizer sales in Haiti with a specific focus on indentifying possible markets for the sale of compost generated by EcoSan projects. Throughout the course of this study, the following market conditions were evaluated in detail:

- the prices, availability and quality of the different options for fertilizer and compost currently available in Haiti,
- the agricultural practices of small-scale farmers,
- the results from preliminary marketing and outreach efforts to potential bulk buyers in the government and NGO sectors,
- social responses to the idea of using EcoSan-generated compost,
- a cost analysis of EcoSan in order to estimate the minimum sales price necessary to fully subsidize sanitation activities with compost sales.

Suggestions for expanding the market for EcoSan-generated compost in Haiti including subsidies and advocacy are then suggested.

Overview of Ecological Sanitation in Haiti

Ecological sanitation (EcoSan) is an integrated sanitation strategy developed through traditional knowledge and biological science in which natural processes are utilized to transform human wastes into fertile soil (Esrey 2001). EcoSan is based on three principles:

1) the prevention of pollution rather than an attempt to control or mitigate it after the fact;
2) the sanitization of urine and poop; and
3) the use of the resulting safe products to enhance agricultural production.

EcoSan solutions are being used in almost every country in the world, and since 2006 Sustainable Organic Integrated Livelihoods (SOIL) has been building EcoSan toilets and composting waste treatment sites in Haiti. Over the years, SOIL has helped launch three additional international organizations devoted to advancing EcoSan initiatives in Haiti (Give Love, Youth Haiti, Vwa Haiti) and provided toilet designs and consultation services to over twenty larger organizations that have decided to implement EcoSan services after seeing the success of initial EcoSan projects.

EcoSan is a particularly valuable technology in Haiti because it simultaneously tackles two of Haiti's most pressing problems:

1) A lack of access to improved sanitation:
   Only 12% of rural Haitians and less than 29% of those living in urban areas have access to improved sanitation facilities, by far the lowest coverage in the Western Hemisphere (UNICEF 2010). Diarrhea and other infectious intestinal diseases cause 5% of all deaths

and 15% of deaths in children under five. Acute diarrheal disease is the number one health problem of Haitian children under age five (PAHO 2010).

2) And declining agricultural productivity and deforestation:
   Haiti is the only nation in the Western Hemisphere in which the majority of citizens subsist as small farmers. Over 60% of inhabitants live in rural areas and two-thirds of the workers are employed in agricultural production. Haitian agriculture is practiced by approximately 600,000 small farmers using an average surface area of 1.8 hectares. Yet, 80% of these farmers cannot satisfy the basic food needs of their families and the majority of producers depend on agriculture for less than half of their family revenue. Soil nutrients have been depleted after 200 years of harvests with minimal nutrient inputs and massive soil erosion caused by almost complete deforestation. In the past decade, per capita food production in Haiti has dropped 20%, forcing the country to import 54% of its food supply (Republic of Haiti 2004).

The output of EcoSan waste treatment is a dark, crumbly humus-rich compost that, in initial agricultural trials conducted by SOIL in Cap-Haitien and Port-au-Prince, has been found in improve the health of plants and increase production as compared to soil with no amendments added.

Consumer Market for Compost

Despite the fact that the majority of the work force in Haiti is tied up in the agricultural sector, agricultural sales account for only 28% of the national GDP and 5.1% of total exports (FAO 2011). In addition, food production is not sufficient to meet local demand and an estimated 58% of the population is undernourished (FAO 2011). With increased access to compost and fertilizers, farmers could boost their yields and thereby improve their family's nutrition and increase household income. It is likely that the positive effect of increased soil inputs would be especially pronounced in Haiti as Haiti currently has one of the lowest rates of fertilizer application in the world (WRI 2006).

Given that fertilizer sales in Haiti closely follow national macroeconomic trends (WRI 2006), it is believed that the low purchasing power of small-scale farmers and the difficulty and cost of transporting fertilizers to agricultural areas are the primary reasons that the use of soil amendments is currently so low. There is some market potential among individual growers, but the largest consumers of fertilizers and soil amendments in Haiti are international organizations and government institutions that purchase in quantity and then redistribute the products through direct farmer aid programs or their own projects to develop the agricultural sector and engage in reforestation activities.

Market-System Maps

Agricultural stores that sell fertilizers, soil amendments and farming implements are common throughout Haiti. Within the Port-au-Prince neighborhoods of Delmas, Petion Ville, Pernier and Croix de Bouquet, there are at least 36 stores that sell fertilizer and supplies (see Key Findings). In the northern Haitian communities surrounding Cap-Haitien, we were able to quickly identify over 51 stores that sell fertilizer and supplies. There are also free or subsidized distribution points for fertilizers and agricultural implements at small stores and depots operated by international organizations throughout the country. For example, the US AID WINNER program operates 37 agricultural boutiques around Haiti.

Methodology

Survey of Agricultural Supply Stores

SOIL conducted a thorough survey of agricultural supply stores in the greater Port-au-Prince metropolitan area (Delmas, Petion-Ville, Thomassaint, Croix-des-Bouquet, Pernier, Centre-Ville, La Plaine) and in the agricultural regions surrounding the city of Cap-Haitien (Limonade, Gran Rivye, Dudre, Bawon, Milot, etc). SOIL agronomists asked a series of questions on compost and fertilizer sales and availability at each store they visited (see Appendix A. Agricultural Store Survey Form for list of questions asked). A total of 36 stores in the Port-au-Prince region and 51 stores in the Cap-Haitien region were surveyed.

Focus Group with Farmers

Farmers from within a mile of SOIL's compost site in Pernier, Port-au-Prince where invited to participate in a focus group on agricultural practices. SOIL's agronomist met with 21 farmers to discuss the issues they were facing in producing their crops, what agricultural technologies they commonly used, whether they used fertilizer, whether they had heard of compost, whether they had heard of EcoSan-generated compost and whether they had any reservations about using EcoSan-generated compost. As the farmers entered the room they were asked to fill out a short questionnaire (see Appendix B. Farmer Questionnaire). A total of 21 farmers participated in this focus group.

Contact with Agricultural and Reforestation Organizations

SOIL made contact with a large collection of organizations working on agricultural or reforestation initiatives in order to learn what types of fertilizer or compost they were currently using, where they had purchased it and for how much, and whether they would be interested in supporting sanitation initiatives in Haiti through the purchase of EcoSan-generated compost.

Cost Analysis of EcoSan-Generated Compost

SOIL has five years of financial records on the costs of building EcoSan toilets and waste treatment sites in Haiti. These records were mined for information on the minimum operating cost necessary to sustain an EcoSan collection program and waste treatment site. SOIL staff then

documented the average amount of waste generated per user and the amount of compost that collected waste produced. These figures were combined to generate an estimate of the average per person cost of providing complete sanitation services (toilet installation, ongoing toilet management and maintenance and waste collection and treatment). The average cost of producing a gallon of EcoSan-generated compost was then calculated based on the total cost of toilet installation, ongoing toilet management and maintenance (monthly) and waste collection and treatment (also monthly) divided by the amount of compost estimated to be generated per month.

Key Findings

Prices, Availability and Quality of Fertilizer and Compost Currently Available
Chemical fertilizer is currently being sold in the Port-au-Prince for an average of $12.50 US (500 gourdes) per 100 pound sack. Compost was only available at 25% of the stores in Port-au-Prince (8 of the 36 stores surveyed) and at six of the eight stores it was being given away for free. Compost for sale was also found at a street side plant nursery in Petion-Ville. The three identified vendors of compost in Port-au-Prince were:

- The Double Harvest store in Croix-des-Bouquet where compost made of shredded sugar cane and rice hulls was being sold for $10.00 US (400 gourdes) for a 50kg sack.
- The Oasis nursery in Petion-Ville where compost made from a mix of organic matter (shredded sugar cane, food peels, animal manure and bat guano) was sold for $2.15 (85 gourdes) per wheelbarrow load.
- And a street-side specialty nursery (selling garden plants such as orchids and ferns) where compost was available for $3.12 (125 gourdes) per feedbag. The vendor said the compost was made from a mixture of shredded sugar cane and animal manure and was produced in the Leogane area.

Chemical fertilizer in Cap-Haitien was being sold for an average of $14.50 (580 gourdes) for a bulk sack of 100 pounds or $3.75 (150 gourdes) for a small bag. None of the stores said that they were giving away compost, but compost was available for purchase at 9% (5 of the 51) of the stores surveyed at an average price of $5.25 US (210 gourdes) for a 90 to 100 pound sack. All of the stores selling compost said that it was locally made from a mixture of animal manure and decomposed plants. The five stores selling compost were located in the agricultural zones of Gran Rivye, Bawon, Milot, Lori and Kanilwiz. And also unlike Port-au-Prince where animal manure was only available in one location and for free, all the northern Haiti stores that carried manure (29% or 15 of the 51) were offering it for purchase. In these stores, the average sale price for manure was $2.50 (100 gourdes) for a 100 pound sack.

Current Small-Scale Farming Practices

Farmers in the agricultural area of Pernier, Port-au-Prince, that hosts SOIL's largest EcoSan composting waste treatment site reported that they commonly added animal manure and chemical fertilizer to their fields (95% of respondents). Fertilizer was most commonly purchased in small quantities, with farmers reporting that they bought a can of fertilizer for $1.86 US (75 gourdes). A total of 57% of farmers in this region said that a lack of water was their largest problem and 38% said insects. The other three problems listed, each by one farmer, were 1) "money", 2) "when the crops aren't good", and 3) "when the plants don't adequately fruit". None of the farmers surveyed said that they had heard of compost or they had ever used it. After attending a seminar on ecological sanitation given by SOIL's agronomist, all the farmers present said they would be excited to try out the compost being generated at the SOIL compost site in Pernier and, if the results were positive, they would be willing to purchase it, particularly if it were lower cost than chemical fertilizer.

Summary of Results from Marketing and Outreach to Potential Bulk Buyers

Over the course of this study, SOIL approached over a dozen organizations and institutions to inquire about the fertilizer they were currently using, how much they paid for it and whether they would be interested in the possibility of purchasing EcoSan-generated compost. We found that many organizations were reluctant to share their procurement practices with us, but a few were very positive about the opportunity to switch from imported chemical fertilizer to a locally-produced organic fertilizer that would support sanitation and livelihood initiatives in Haiti. And most significantly, none of the organizations contacted said they would rule out the future possibility of purchasing EcoSan-generated compost if they weren't already using it.

The Ministry of Agriculture and the Food and Agriculture Organization (FAO) responded that they were currently purchasing chemical fertilizer either for direct use or to provide free or subsidized to project beneficiaries, but they would potentially be interested in using EcoSan compost in the future. The Ministry of Agriculture said their primary reason for not purchasing compost at this point was because they had not identified a demand for it, but they said that if farmers began to request it they would try to access it for them.

Four organizations expressed interest to SOIL in beginning to immediately use EcoSan-generated compost in agricultural trials with the possibility of buying it in bulk if results are positive: the Mennonite Central Committee (MCC), US AID WINNER, the United Nations Environmental Programme (UNEP) and the Haiti Fund for Innovation and Reconstruction (HFIR).

Two organizations are interested in the possibility of buying SOIL compost in the near future for their reforestation activities. World Vision is currently using compost for reforestation at the Corail resettlement camp in Port-au-Prince, and they responded that they would be very interested in purchasing EcoSan-generated compost for future projects. They have still not responded with figures on how much they purchased their first batch of compost for. And US

AID OTI has also started negotiations with SOIL to purchase compost for upcoming reforestation projects.

SOIL's compost is currently being used by a community-based organization in Cite Soleil: Pax Christi. Pax Christi worked closely with SOIL on the installation of public toilets in Cite Soleil IDP camps following the earthquake and then offered to provide land for a SOIL compost site in Cite Soleil if SOIL would give the organization compost to use in their urban gardening projects. Initial results show that the compost is having a positive effect on the garden and the entire project (EcoSan toilets, compost site and EcoSan-generated compost being used for local food production) is extremely well received by the community. Over the next year, SOIL plans to expand EcoSan projects in this community with a pilot household toilet system and improvements to the compost site. Pax Christi has said they want the compost as fast as it can be produced.

And SOIL recently made its first sale of EcoSan compost: Matthew 25 Guest House in Delmas 33 has asked to buy a truckload of compost for $300 US in order to rehabilitate the community soccer fields at the neighboring Park Izmery. Park Izmery was turned into a field hospital after the earthquake and then became an IDP camp for the following year. The IDP camp committee worked with temporary residents to find them homes elsewhere and the community is now working to till the packed ground and replant it for a soccer field. The community committee responsible for the soccer field is familiar with SOIL's work as they participated in the construction of our first EcoSan toilet in Port-au-Prince which is next to the soccer field.

Social Responses to the Idea of Using EcoSan-Generated Compost

One of the first questions people always ask when they learn about compost made from human waste is whether it is truly safe for agricultural use. Upon learning that all potentially harmful micro-organisms are killed during the compost process, a common follow-up question is whether farmers are willing to use it. SOIL staff have found that while people in Haiti often have a few initial reservations about the idea of human waste compost, almost everyone becomes excited about the idea when the process is explained and especially when the positive results of its application are demonstrated. The following two anecdotes are indicative of the common public reaction that SOIL has witnessed in Haiti in response to information on EcoSan:

- At a seminar on EcoSan that SOIL hosted in September 2010, participants at the end were asked if they wanted to take home a small plastic cup of EcoSan-generated compost to try in their gardens. So many people rushed to get a sample, that supplies almost immediately ran out.
- At the farmer focus group conducted for this study, every farmer initially said they had not heard of EcoSan compost but after listening to a talk on how it was made every single participant said they would be interested in trying it on their fields as soon as it becomes available.

SOIL has continually found that the people most familiar with the EcoSan concept are the ones most interested in using it agriculturally. This is evident in the fact that the one organization currently using SOIL's EcoSan-generated compost, Pax Christi, has built an urban garden right next to several public SOIL EcoSan toilets and community members widely advertise where their compost comes from. Also the first organization that has offered to purchase compost, the Matthew 25 Guest House, is doing so at the request of a former IDP camp members that have been using a SOIL public EcoSan toilet for the past year and now want to add the compost they helped generate to the soccer field they are rehabilitating in place of where the camp used to be.

EcoSan-generated Compost Cost Analysis

EcoSan is a unique sanitation solution in Haiti because it is currently the only option for *complete* waste treatment. Toilet wastes from all other types of toilets in Haiti are left untreated (either in underground pits that ultimately leach into the groundwater or at waste dumping sites), thus perpetuating public health problems. Cost analyses of different toilet options often don't account for the negative externalities resulting from the public health and environmental problems caused by current waste management practices, but even without the inclusion of these externalities EcoSan toilets often cost less or the same per user than other sanitation options in Haiti.

Using SOIL's financial records for providing EcoSan services, SOIL generated both per toilet and per user cost assessments using conservative estimates of the total ongoing costs involved with collecting and treating wastes from ecological sanitation toilets (see Table 1).

Table 1. Cost analysis of providing EcoSan services in Haiti.

	Cost Per Toilet (Monthly) (USD)[1]	Cost Per User (Monthly) (USD)	Cost Per 100 LBS of Compost Produced (USD)
5,000 private EcoSan toilets[2]	$2.19	$0.29	$11.23
1,500 private EcoSan toilets	$3.16	$0.42	$16.24
1,000 private EcoSan toilets	$4.18	$0.56	$21.43
500 public EcoSan toilets	$28.61	$0.57	$11.01
500 Oxfam public elevated latrines serviced by Sanco[4]	$27.50	$0.91	-
500 public portable toilets serviced by Jedco[5]	$434.00	$4.34	-

[1]Cost assessments include all costs associated with the collection and treatment of wastes for a SOIL EcoSan toilet in one of the Port-au-Prince neighborhoods currently on a delivery schedule including vehicle depreciation, gas mileage and salaries of compost site and collection laborers.
[2]Private toilet costs per user are based on an estimated 7.5 user accessing each household toilet.
[3]Per user costs for public toilets are based on an average of 50 users per public toilet.
[4]Based on the estimated amount of money Oxfam GB pays Sanco to de-sludge toilets in IDP camps in Port-au-Prince. The cost per user is a rough estimation based on 30 people per toilet as predictions for the total number of people using the public toilets vary widely.
[5]A portable toilet serviced by Jedco costs $14 USD per day to maintain (figures from Concern).

Main Recommendations and Conclusions

It is virtually impossible to provide sanitation services without private sector involvement and user fees, government support and oversight or dependency on international relief organizations, and Haiti is no exception. The abysmal level of sanitation coverage in Haiti is indicative of minimal private sector engagement, lack of government resources earmarked for sanitation programs and the inability of the NGO community to effectively raise money for sustaining long-term sanitation interventions. Ecological sanitation provides a possible alternative path given that there are many potential revenue streams in EcoSan provision and small businesses or financially-responsible organizations could potentially cover the costs of providing sanitation services using a combination of these different revenue streams to support the system.

There are three main potential revenue streams common to all organizations and businesses working in the sanitation sector in Haiti:

1. Toilet installation or construction fees
2. Individual user fees
3. Waste collection and transportation fees

But there are two additional revenue streams that are unique to EcoSan projects:

1. Waste treatment fees (either paid by individuals for their household toilets or by organizations contracting an EcoSan waste treatment site)
2. Compost sales to individual farmers, peasant organizations, government institutions and international NGOs

The goal of this market report was to evaluate the potential income earnings from sales of EcoSan-generated compost as a way to subsidize the provision of complete sanitation in Haiti. Findings from this study suggest that while the market for compost in Haiti is still not fully developed, there is currently a significant income opportunity in compost sales. Also with a little effort put into marketing and outreach, SOIL was able to generate interest among several large-scale buyers such as World Vision, UNEP and US AID OTI. We expect that with continued efforts to market EcoSan-generated compost in Haiti more organizations will contact us about their future projects that need compost and we will increase the number of sales.

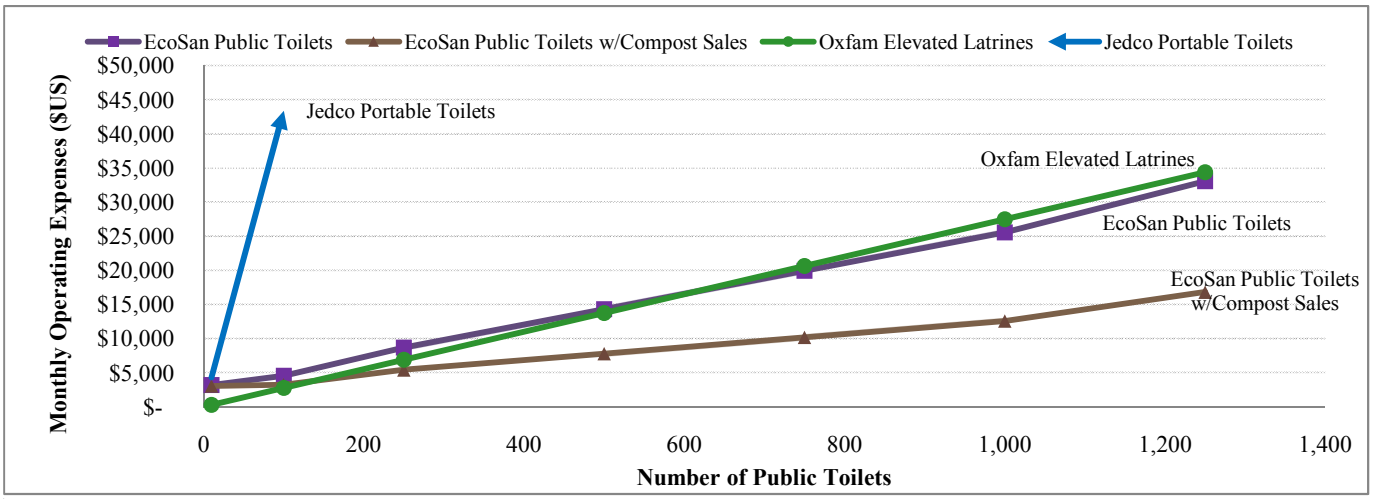
But even with compost sales alone, EcoSan projects are unlikely to breakeven at their current scale in Haiti because the cost to produce 100 pounds of EcoSan-genated compost exceeds the current market rate for compost in Haiti (see Table 1). However if compost sales are complemented by other potential revenue streams, such as private toilet collection and treatment fees, the full costs of providing ecological sanitation services are quickly covered (see Table 2).

Table 2. Monthly income and expenses from providing EcoSan services in Haiti. With the inclusion of income from compost sales and monthly waste collection and treatment fee for private households, EcoSan service costs are fully covered at a total of 1,282 household toilets.

	Monthly income from compost sales[1]	Monthly income from private toilet collection and treatment fees[2]	Net monthly (expense) or income
5,000 private EcoSan toilets	$4,870	$12,658	$6,591
1,500 private EcoSan toilets	$1,461	$3,797	$514
1,282 private EcoSan toilets	$1,249	$3,246	$0 (Breakeven Point)
1,000 private EcoSan toilets	$974	$2,532	($669)
500 public EcoSan toilets	$12,988	-	($12,576)
500 Oxfam public elevated latrines serviced by Sanco[3]	-	-	($13,750)[3]
500 public portable toilets serviced by Jedco[4]	-	-	($217,000)

[1]Compost sales were estimated based on an average price of $5 USD per 100 pound sack, which is lower than the average sale price of compost found through this study.
[2]Monthly income from private toilet fees is based on SOIL's predictions that we will be able to charge a collection and treatment fee of $2.50 (100 gourdes) per private household toilet. SOIL will begin installing private household toilets this spring.
[3]Based on the estimated amount of money Oxfam GB pays Sanco to de-sludge toilets in PAP IDP camps.
[4]A portable toilet serviced by Jedco costs $14 USD per day to maintain (figures from Concern).

Figure 1. Monthly total operating expenses of different sanitation options in Haiti. With sales of compost at or below current market rates in Haiti, EcoSan public toilets are by far the cheapest sanitation choice (although neither pit latrines nor the negative health and environmental externalities of all non-EcoSan options are included in this analysis).



*Monthly operating expenses were calculated using the same assumptions used in Table 1.

Based on income from just two of the five potential income streams for providing ecological sanitation services, an EcoSan project with 1500 private household toilets would make income for the small business or organization providing the service. When the other potential income streams are also factored in, it becomes evident that there are many potential livelihood opportunities in ecological sanitation. In order to further develop the small business opportunities in this sector, organizations providing EcoSan services could contract out services such as waste collection and compost sales to micro-enterprises.

Other countries providing ecological sanitation services as part of their waste treatment efforts have also found that while compost sales alone cannot fully cover the costs of waste collection and treatment, they can reduce the overall annual operating expense of providing sanitation services. For example, the city of Los Angeles, California hosts the largest biosolids treatment facility in the United States and generates over 90,000 tons of compost per year (IERCA 2011). The city then sells the compost for gardening and agricultural use. Even though the sales of compost alone do not cover the total costs of operating the waste compost facility, the income does contribute to making this the cheapest possible waste treatment program the city could undertake.

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